COMPARISON OF GREEN ENHANCED FLUIDITY REVERSED PHASE LIQUID CHROMATOGRAPHY WITH HPLC

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The growing interest in high throughput assays is the result of the increasing numbers and complexity of samples being produced by modern combinatorial synthetic procedures. The low viscosities and high diffusivities of enhanced fluid mixtures allow highly efficient separations to be achieved with analysis time gain as compared to High-performance liquid chromatography (HPLC). In this study, possibilities and limitations of HPLC mobile phases ethanol/water, acetonitrile/water, and methanol/water at higher proportion aqueous content and acetone/ acetonitrile as non-aqueous mobile phases were evaluated to compare liquid chromatography with green enhanced fluidity liquid chromatography (EFLC) separations by adding different concentrations of carbon dioxide as ternary mobile phase. The techniques were evaluated via van Deemter plots on reversed phase columns. EFLC allows reduce analysis time reduction and to obtain improved column efficiencies by effectively increasing the permeability of the system and by ensuing faster diffusion kinetics and further better selectivity. Similarly the impact on retention and separation in reversed phase using C18 and Naphtylethyl (π NAP) stationary phases were explored. A mixture of 16 priority PAH pollutants were used to investigate these effects. Next to interesting changes in selectivity improvements in analysis time and shifting Van Deemter curves could be measured in this way demonstrating the potential of this new green variant of HPLC.

Key words: Green chromatography, enhanced fluidity liquid chromatography, SFC CO_2, ethanol, methanol, acetonitrile, water , reversed phase